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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/625,736

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In-gu Kwak

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8060

21171

7590

10/12/2004

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EXAMINER

LEE, PETER

ART UNIT

PAPER NUMBER

2852

DATE MAILED: 10/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/625,736	Applicant(s) KWAK, IN-GU	
	Examiner Peter Lee	Art Unit 2852	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: Reference part 264a as seen in Figure 2 is not mentioned in the specifications. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 states the heater and the roller rotate in opposite directions. However, claim 14

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also depends upon claim 13 that states the limitation of the heater being stationary. It is seen that a stationary heater cannot be in rotation.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 4, 5, 6, 7, 8, 9, 12, 13, and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Hirst et al. (US pn 6580895). As to claim 1 Hirst teaches an image fixing system (Fig. 2 reference 102) of an electro-photographic imaging device (Fig. 1 part 100) comprising: a pressure roller (Fig. 2 part 138); a heating element (Fig. 2 part 214); and a fuser roller (Fig. 2 part 136) (ie. heating roller), the heating member being installed inside of the fuser roller (Fig. 2), to rotate with the pressure roller to fix a developed image to a fed paper by applying heat generated by the heating element (col. 3 line 60 – col. 4 line 5), wherein the fuser roller is comprised of a coaxial outer tube (Fig. 2 part 212) that surrounds an inner tube (Fig. 2 part 210) (ie. a heat pipe of a closed tube type).

As to claim 2, Hirst further teaches an interior space (Fig. 4 part 306) between the said inner and outer tubes of the fuser roller wherein a port (Fig. 4 part 408) can be used to inject a liquid (col. 6 lines 56-60) (ie. the heat pipe of the closed tube type forms a closed space therein and has a fluid inside of the closed space).

As to claim 4, Hirst further teaches the heating element, upon which the fuser roller rotates, (Fig. 4 part 214) being made to extend beyond the tube of the heating roller to be fixedly mounted to the fusing system (col. 6 lines 17- 20) (ie. heating roller rotates separately from the heating member).

As to claim 5, Hirst teaches an electrophotographic imaging device comprising of a fuser roller and a pressure roller that are rotated so that a recording material may pass in between through a nip in order to fuse a toner image to the surface of the recording material (col. 3 line 66 – col. 4 line 3), and the fuser roller is equipped with an interior space filled with a liquid to provide a mechanism to ensure temperature equalization across the nip parallel to the axis (col. 6 line 56-60) (ie. outer surface having a uniform surface temperature).

As to claim 6, Hirst further teaches a fusing device which embodies an internal heating element (Fig. 4 part 214) that will heat the fuser roller and bring the fuser roller to the desired fusing temperature as in previous embodiments (col. 7 lines 14-18) (ie. heater to heat the outer surface to the uniform surface temperature).

As to claim 7, Hirst further teaches the fuser roller having an inner and outer tube preferably made of copper metal (ie. conductor) which together form an interior space (Fig. 4 part 306).

As to claim 8, Hirst further teaches a liquid (ie. working fluid) being injected into the interior space (Fig. 4 part 306) between the interior and outer tube of the fuser roller (col. 6 line 56-60).

As to claim 9, Hirst further teaches the fusing system, which includes the liquid inside of the interior space mentioned above, being heated by the internal heating element (Fig. 2 part

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214) so that the liquid will be vaporized at operating temperature (col. 7 line 16-18) (ie. heater heats the working fluid in the space).

As to claim 12, Hirst further teaches the fusing roller (fig. 4 part 136) of the fusing system being mounted rotatably onto bearings (Fig. 4 parts 404 and 406; col. 6 lines 10-12), while the internal heating element (Fig. 4 part 214) extends beyond the inner and outer tubes of the fusing roller to be fixedly supported onto mount (col. 6 lines 17-20) (ie. roller rotates separately from the heater).

As to claim 13, Hirst further teaches the fusing roller (fig. 4 part 136) of the fusing system being mounted rotatably onto bearings (Fig. 4 parts 404 and 406; col. 6 lines 10-12), while the internal heating element (Fig. 4 part 214) extends beyond the inner and outer tubes of the fusing roller to be fixedly supported onto mount (col. 6 lines 17-20) (ie. heater is stationary and the roller rotates).

5. As to claim 17, Hirst teaches an electrophotographic image device (Fig. 1 part 100) (ie. image forming apparatus), comprising: a photoconductive drum (fig. 1 part 106) (ie. first roller) to form an electrostatic latent image thereon; a developing roller with developing toner (Fig 1 part 112; col. 3 lines 33- 38) (ie. developer to develop the electrostatic latent image); a transfer roller (fig. 1 part 128) to attract the toner off the photoconductor drum and onto the recording medium (ie. second roller to transfer the developed image to a recording medium); and a fixing device (fig. 1 part 102) to fix the transferred image to the recording medium, comprising: a fuser roller (fig. 1 part 136) to rotate about an axis (col. 6 lines 17-20; the tubes of the fuser roller are said to rotate about the internal heating element 214 in fig 2 which serves as the "axis" of rotation) to fix a toner image to the recording medium, the roller comprising an outer surface

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having a mechanism for temperature equalization in the liquid filled interior space (col. 6 lines 56-60) (ie. uniform surface temperature in a direction of the axis).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3, 10, 11, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirst et al. (US pn 6580895; from hereon will be referred to as Hirst(1)) in view of Hirst et al. (US pn 6721530; from hereon will be referred to as Hirst(2)). As to claim 3, Hirst(1) teaches all of the limitations set above except for having an induction heating body to generate a magnetic field. It is Hirst(2) who teaches the use of an induction heating element inside of a fuser roller (ie. heating roller) to generate a high frequency magnetic field to induce heat (col. 1 lines 52-58). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use an internal induction heating element for the fusing apparatus as seen in Hirst(1) (col.5 line 64-65; quoted from Hirst(1) to show that consideration of an internal induction heating element was made in the base reference, but needed the secondary reference to read upon the claim language) to create a magnetic field within the fuser roller. One of ordinary skill in the art would have been motivated to use such an induction heating element because it has the advantage over other conventional heating methods such as the ability to heat up the

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roller quickly without increasing energy use, not requiring a sliding contact between the coil and the inner surface of the fuser roller, and it provides greater temperature control (col. 1 line 59- col. 2 line 3).

7. As to claim 10, Hirst(1) teaches all of the proceeding limitations as seen above. In addition Hirst(1) teaches having an internal heating element which may be an induction heating element (col.5 lines 64-65) used to heat up the fuser roller (fig. 4 part 136).

As to claim 11, Hirst(1) teaches that once the fusing system (Fig. 1 part 102) is heated up to operating temperature by the internal heating element (Fig 4 part 214), the liquid (ie. working fluid) inside the interior space of the fuser roller (Fig. 4 part 306) is vaporized (ie. fluid changes phase according to the heat generated).

As to claim 15, Hirst(2) teaches that the liquid (ie. working fluid) within the interior space of the fuser roller (fig. 4 part 306) is allowed to continually change phase within this space in accordance with the temperature changes (col. 7 line 39-40) (ie. phase changed working fluid is circulated within the space).

As to claim 10, Hirst(1) does not teach the specifics of the induction heating member being a heating coil that induces magnetic fields used to heat up an inner conductor tube. It is Hirst(2) who teaches a coil of an induction heating element used to generate a high frequency magnetic field that induce eddy currents within the roller (ie. inner conductive tube being a part of the roller) to create heat (col. 1 lines 52-58). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use an internal induction heating element for the fusing apparatus as seen in Hirst(1) (col.5 line 64-65; quoted from Hirst(1) to show that consideration of an internal induction heating element was made in the base reference,

but needed the secondary reference to read upon the claim language) to create a magnetic field within the fuser roller. One of ordinary skill in the art would have been motivated to use such an induction heating element because it has the advantage over other conventional heating methods such as the ability to heat up the roller quickly without increasing energy use, not requiring a sliding contact between the coil and the inner surface of the fuser roller, and it provides greater temperature control (col. 1 line 59- col. 2 line 3).

8. As to claim 16, Hirst(1) teaches an image fixing system (Fig. 2 reference 102) of an electro-photographic imaging device (Fig. 1 part 100) comprising: a pressure roller (Fig. 2 part 138); and a fuser roller (Fig. 2 part 136) (ie. heating roller), the heating member being installed inside of the fuser roller (Fig. 2), to rotate with the pressure roller to fix a developed image to a fed paper by applying heat generated by the heating element (col. 3 line 60 – col. 4 line 5), wherein the fuser roller is comprised of a coaxial outer tube (Fig. 2 part 212) that surrounds an inner tube (Fig. 2 part 210) (ie. a heat pipe of a closed tube type). Hirst(1) does not teach having an induction heating coil. It is Hirst(2) that teaches the use of a coil as an induction heating element inside of a fuser roller (ie. heating roller) to generate a high frequency magnetic field to induce heat (col. 1 lines 52-58). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a coil as an internal induction heating element for the fusing apparatus as seen in Hirst(1) (col.5 line 64-65; quoted from Hirst(1) to show that consideration of an internal induction heating element was made in the base reference, but needed the secondary reference to read upon the claim language) to create a magnetic field within the fuser roller. One of ordinary skill in the art would have been motivated to use such an induction heating element because it has the advantage over other conventional heating methods

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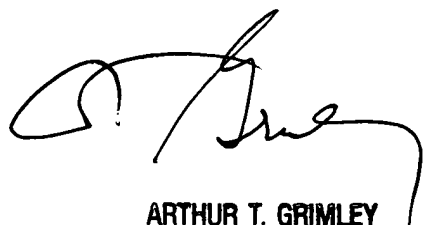
such as the ability to heat up the roller quickly without increasing energy use, not requiring a sliding contact between the coil and the inner surface of the fuser roller, and it provides greater temperature control (col. 1 line 59- col. 2 line 3).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Lee whose telephone number is 571-272-2846. The examiner can normally be reached on mon-fri 9:00 am-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Arthur Grimley can be reached on 571-272-2136. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PL 10/4/04



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